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New host record for *Entylia carinata* (Forster) (Hemiptera: Membracidae)

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Abstract. Yacon, *Smallanthus sonchifolius* (Poepp.) H. Rob (Asteraceae), is recorded as a new host plant for *Entylia carinata* (Forster) (Hemiptera: Membracidae) in Mt. Holly, NC. Adults, nymphs, and attending ants were found on numerous plants.

Key words. Treehopper, new host plant.

Introduction

Treehoppers (Hemiptera: Membracidae) are sap-sucking insects found all over the world except the polar ice caps and Madagascar. There are approximately 3,500 species (Deitz et al. 2011). They usually feed on new growth of various herbaceous and woody plants. Most species have host plant preferences either at the species level or genus level. Some treehoppers are of economic importance (including the buffalo treehopper, *Stictocephala bisonia* Kopp and Yonke, and the three-cornered alfalfa hopper, *Spissistilus festinus* (Say)) but few species aggregate on plants in numbers harmful to the plant. *Entylia carinata* (Forster) is a common species found throughout the United States. It is polyphagous, recorded on numerous host plants in several families. This paper records a new host plant, yacon (*Smallanthus sonchifolius* (Poepp.) H. Rob (Asteraceae)) for this ubiquitous species.

Materials and Methods

Adult and nymph specimens of *E. carinata* were observed in the garden of one of the junior authors, Allein Stanley. Photographs of adults, nymphs, and ants were taken by junior author Todd Elliott (Fig. 1). Specimens of adults, nymphs, and ants were collected, killed in 80% EtOH, brought back to the Schiele Museum lab, dried, and mounted (ants and adult treehoppers pinned; nymphs glued to punched points). The specimens were identified by examination through an AmScope SM-1TZ Professional Trinocular Stereo Zoom Microscope, WH10× Eyepieces, 3.5–90× Magnification, 0.7–4.5× Zoom Objective, Ambient Lighting, Large Pillar-Style Table Stand with 0.5× and 2.0× Barlow Lenses.

Voucher specimens (nine ♀♀, six ♂♂, eight nymphs and two *Formica subsericea* (Say) workers) were all identified by the senior author and were deposited in the Arthropod Collection at the Schiele Museum of Natural History, Gastonia, NC, USA. Since the Schiele Museum of Natural History does



Figure 1. *Formica subsericea* (Say) attending nymphs and adults of *Entylia carinata* (Forster) on yacon (© 2017 Todd Elliott).

not have a coden on The Insect and Spider Collections of the World Website (Evenhuis 2018) or the Biodiversity Collections Index Website (Waibel 2008), SMNC is used based on the precedent set in a previous publication (Bartlett et al. 2008).

Results and Discussion

Observations of *E. carinata* and attending ants were recorded on October 10, 2017 on numerous plants of yacon, *Smallanthus sonchifolius* (Poepp.) H. Rob (Asteraceae/Compositae) by the junior author Allein Stanley at her garden in Mt. Holly, NC (35.308611, -81.081667, 236' elevation). Table 1 includes previously recorded host plants, their families and cited references. Plant names and families used in Table 1 coincide with those in the PLANTS Database (USDA 2018). Yacon has not been recorded previously as a host plant of *E. carinata*.

Yacon, also known as Peruvian ground apple, is traditionally grown in the northern and central Andes from Colombia to northern Argentina. It has recently been introduced into the United States, is available at farmer's markets, and is grown for its sweet tasting tuberous roots (Caetano et al. 2016).

Both adults and nymphs of *E. carinata* are commonly attended by ants for their honeydew secretions. In addition to *Formica subsericea* (Say) (Wood 1977; Olmstead and Wood 1990), which was found attending the adults and nymphs on yacon, the following ant species are also recorded as attending *E. carinata*: *Camponotus ferrugineus* (Fabricius) (Olmstead and Wood 1990), *Prenolepis imparis* (Say) (Olmstead and Wood 1990), *Tapinoma sessile* (Say) (Olmstead and Wood 1990), and *Camponotus pennsylvanicus* (DeGeer) (Wood 1977).

Table 1. Previously recorded host plants of *Entylia carinata* (Forster).

Host Plant	Family	Reference
<i>Ambrosia artemisiifolia</i> L.	Asteraceae	Dietrich et al. 1999
<i>Ambrosia trifida</i> L.	Asteraceae	Funkhouser 1917, Dennis 1952, Wood 1977
<i>Ambrosia</i> sp.	Asteraceae	Dietrich et al. 1999
<i>Aster</i> sp.	Asteraceae	Dietrich et al. 1999
<i>Bidens bipinnata</i> L.	Asteraceae	Dietrich et al. 1999
<i>Bidens coronata</i> (L.) Britton	Asteraceae	Dietrich et al. 1999
<i>Bidens</i> sp.	Asteraceae	Dietrich et al. 1999
<i>Carya ovata</i> (Mill) K.Koch	Juglandaceae	Dennis 1952
<i>Cercis canadensis</i> L.	Fabaceae	Osborn 1940
<i>Cirsium arvense</i> (L.) Scop.	Asteraceae	Wood 1977
<i>Cirsium vulgare</i> (Savi) Ten.	Asteraceae	Dennis 1952, Wood 1977
<i>Cirsium altissimum</i> (L.) Hill	Asteraceae	as <i>Cnicus altissimus</i> in Branch 1913
<i>Conyza canadensis</i> (L.) Cronquist	Asteraceae	Dietrich et al. 1999
<i>Dahlia</i> sp.	Asteraceae	Dietrich et al. 1999
<i>Erechtites hieraciifolia</i> (L.) Raf. ex DC.	Asteraceae	Dietrich et al. 1999
<i>Erigeron</i> sp.	Asteraceae	Dietrich et al. 1999
<i>Eupatorium capillifolium</i> (Lam.) Small	Asteraceae	Dietrich et al. 1999
<i>Eupatorium pilosum</i> Walter	Asteraceae	Dietrich et al. 1999
<i>Eupatorium</i> sp.	Asteraceae	Dietrich et al. 1999
<i>Eutrochium maculatum</i> (L.) E.E. Lamont	Asteraceae	as <i>Epatorium maculatum</i> in Funkhouser 1917
<i>Glycine max</i> (L.) Merr.	Fabaceae	Dietrich et al. 1999
<i>Helianthus annuus</i> L.	Asteraceae	Branch 1913, Dietrich et al. 1999
<i>Helianthus tuberosus</i> L.	Asteraceae	Dietrich et al. 1999
<i>Helianthus</i> sp.	Asteraceae	Wood 1977
<i>Medicago sativa</i> L.	Fabaceae	Branch 1913
<i>Melilotus officinalis</i> (L.) Lam.	Fabaceae	as <i>Melilotus alba</i> in Branch 1913
<i>Panicum dichotomiflorum</i> Michx.	Poaceae	Funkhouser 1923
<i>Phleum alpinum</i> L.	Poaceae	Branch 1913
<i>Quercus macrocarpa</i> Michx.	Fagaceae	Dennis 1952
<i>Quercus palustris</i> Münchh.	Fagaceae	Dietrich et al. 1999
<i>Quercus rubra</i> L.	Fagaceae	Dennis 1952
<i>Silphium perfoliatum</i> L.	Asteraceae	Kopp and Yonke 1973
<i>Silphium</i> sp.	Asteraceae	Dietrich et al. 1999
<i>Solanum tuberosum</i> L.	Solanaceae	Dietrich et al. 1999
<i>Solidago</i> sp.	Asteraceae	Kopp and Yonke 1973
<i>Verbesina alternifolia</i> (L.) Britton ex Kearney	Asteraceae	Dietrich et al. 1999
<i>Vitis rotundifolia</i> Michx.	Vitaceae	Dietrich et al. 1999
<i>Vitis</i> sp.	Vitaceae	Dietrich et al. 1999
<i>Zanthoxylum americanum</i> Mill.	Rutaceae	Dennis 1952

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